# Exhibit 74

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DEPARTMENT OF THE NAVY
BUREAU OF MEDICINE AND SURGERY
WASHINGTON 25, D.C.

IN REPLY REFER TO

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15 January 1960

From: Chief, Bureau of Medicine and Surgery
To: Activities Submitting Occupational Health Reports (NavMed 576)

Subj: Occupational Health Hazards; Release No. 22

Ref: (a) MANMED 23-21

Encl: (1) List of Occupational Health Hazards (July - September 1959)

1. The Quarterly Occupational Health Reports (NavMed 576) for July through September 1959, submitted in accordance with reference (a), have been reviewed. Potential health hazards of special interest have been selected from these reports and are forwarded herewith as enclosure (1).

2. The compilation contained in enclosure (1) is intended as a ready reference to current problems, and in some instances will help avoid duplication in the solution of these problems. It is also intended to aid Medical Department personnel in the recognition of potentially hazardous materials and processes. Further detailed information regarding specific hazards noted in enclosure (1) may be obtained from the originating activity.

3. The information contained herein on the composition of materials is to be treated as manufacturer's "DISCREET" proprietary information, in accordance with SecNav Instruction 5570.1A of 6 April 1957, and is to be used solely for the control of potentially toxic materials. It is not to be released for any other purpose.

4. The request for information pertaining to the social and scientific activities of personnel engaged in the Occupational Health Program has been favorably received and is appreciated. A subtitle for industrial hygiene services provided the Fleet will be included henceforth under the subtitle "Shipboard Industrial Hygiene Surveys and Investigations".

LLOYD B. SHONE
By direction

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OCCUPATIONAL HEALTH HAZARDS
Derived from Industrial Health Reports
July 1959 through September 1959

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1. Chemical Health Hazards.

A. Inhalation Hazards Due to Gases, Vapors, Fumes and Dusts

1. 1,1,1-Trichloroethane. Following a Medical Admission to the Dispensary an investigation was made on a submarine undergoing repair. The workman involved had been preparing surfaces and brush painting with Plasite Paint Formula No. 7144 in the Sanitary Tank which was about four feet square and six feet deep. No ventilation was provided to the space and the workman had about a pint of the paint in the tank with him. After being in the tank approximately one hour he was found to be unconscious and removed to the Dispensary. A witness said that the workman was wearing an organic vapor respirator at the time of his removal from the tank.

Plasite Paint contains about 35% 1,1,1-Trichloroethane. Other common names for this solvent are Methyl Chloroform, Vythene, Chlorothene and Magselect. 1, 1, 1-Trichloroethane is very volatile, requiring little heat to cause evaporation. Plasite is an epoxy resin type paint and is mixed with an amine hardener prior to application. The exothermic reaction of the mixture may have been a factor in the workmen's exposure. The vapor is heavier than air and therefore tends to displace air in enclosed spaces. The organic vapor respirator worn by the workmen is designed to remove vapors from the air when concentrations do not exceed 1,000 parts per million (ppm). It had a knitted cotton facelet over the contact area between the face and the mask. In testing the efficiency of the respirator it was noted that it was not possible to pull a vacuum by closing off the inlets to the organic vapor cartridges. This indicated that the workman was breathing the contaminated air around the facelet. Because of the potential hazard involved in the Plasite application it was recommended that air supplied respirators and ventilation be provided during such work on interior surfaces. It was also recommended that organic vapor respirators be used only when applying petroleum spirit type paint vehicles and that the facelets be removed prior to issue. (1)

2. A request was received to test the cable tanks and cones of a cable-laying ship for oxygen content and for the presence of any toxic or injurious gases. The request was made because of a casualty occurring on a similar ship operating in the Atlantic. Oxygen valves ranged from 5.5% to 20.4% and carbon dioxide from 11.7% down to 0.0%. Carbon monoxide concentrations of about 5 ppm were found in one tank and its associated cone. Tests for hydrogen sulfide, chlorinated hydrocarbons, arsine, phosgene, nitrous gases, and flammable vapors (19)

enclosure (1)

were all negative. The most serious potential hazard existed in a cone with an oxygen content of 5.5% and a carbon dioxide content of 11.7%. The source of the carbon dioxide has not been established but may be produced by bacterial or chemical action on the whiting used to keep the cable from sticking. (19)

3. Rapid drying primers. A study is in progress to determine the feasibility of the use of rapid drying primers for steel plate. The search is particularly slanted toward obtaining a paint which may be welded upon without producing a faulty weld. At present, zinc chromate primer must be removed in the way of welding because of porosity of the weld. The Industrial Hygiene Division investigated the health aspects of two of these paints, a lacquer primer and an acrylic ester base paint. Application of rapid drying paints always poses an industrial health problem because of the evaporation of solvents. When applied outdoors in the steel yard, sufficient dilution of vapors should occur so that exposure to hazardous concentrations would be limited to those engaged in the actual application. Application of lacquers or acrylic paints elsewhere would require precautions similar to those now used for Saran and epoxy coatings. Tests were made for potential health hazards created by the decomposition of the dried paint film by welding and burning. Tests were made for carbon monoxide, oxides of nitrogen, phosgene, acidic or alkaline gases, and aldehydes were found under laboratory conditions. To date, tests indicate that the normal precautions used in welding or burning, i.e., the proper use of exhaust ventilation or respiratory protection, should prevent exposure. However, should welding or burning take place on a bulkhead or deck coated with material on the opposite side, decomposition of the paint could occur in adjoining spaces with harmful results. (4)

4. Inhalation. The first application of Devran Coating by this shipyard was accomplished without incident. The coating was applied hot (about 160° F.) by spray methods to the interior of submarine ballast tanks. Complete skin protection and the use of air line respirators were required for painters applying the coating. Gloves and charcoal-type respirators were used by painters mixing or carrying the resin. Tests for organic amines and for butyl cellosolve in the exhaust air from the ventilating system and in the area immediately over the mixing tank were well within the accepted permissible limits. (19)

5. Employee inhaled chlorine while attempting to clear the atmospheric vent tube to a chlorinator by blowing into the tube with his mouth. When the obstruction was blown clear the chlorine fed back into the line and the employee inhaled enough gas to cause respiratory discomfort and throat irritation. An investigation of work methods indicated the present practice of clearing plugged chlorine lines by blowing into them should be discontinued; the use of an aspirator was recommended for this purpose. It was further recommended that employees working on chlorine charged lines or equipment wear the gas mask provided. (9)

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6. Trichlorethylene. Employees on a 2nd. deck of a building complained that a strong solvent odor was present in the shop and a number of them felt dizzy and nauseated. Investigation failed to reveal any use of solvents in the shop but there was an unmistakeable odor of trichlorethylene the source of which was finally traced to a shop on the 1st. deck. There a vapor degreaser was found to be improperly used. The rinse nozzle was connected to a source of compressed air and clouds of trichlorethylene vapors were being blown out of the machine. The tremendous amounts of contaminant thus created permeated the work area and channeled through the ceiling to the floor above. The steam pressure was set too high, so that the solvent was overheated. The vapor cut-off thermostat was inoperative. The operator wore a chemical cartridge respirator which apparently was inadequate because he complained of "feeling drunk". The other employees nearby were also affected. The machine was ordered taken out of use until such time as a liquid pressure pump would be installed instead of compressed air for the rinse operation and until other repairs were made to ensure that the vapors are controlled. This was accomplished within a few days. Follow-up tests were made and the vapor concentrations were found to be consistently below 50 parts per million indicating that normal conditions were obtained. (5)

7. Fumes from Burnout Tests. An investigation was made in the Power Section of the Material Laboratory, Bldg. #296, in which is located a high power test station which can apply as high as 100,000 amperes and 500 volts to circuit breakers and other power equipment undergoing test. These tests are made intermittently and personnel must be in the control room at time of test. Any burnouts that occur dissipate fumes and g ses into the open high ceiling area above the test cell. In some instances an air line hose may be used to blow out fumes that still linger in the equipment tested. Under conditions of operation observed, there is no hazard to personnel from inhalation of fumes or gases and installation of exhaust blowers is not considered necessary. (10)

8. Industrial hygiene practices were formulated for the fabrication of the lead shielding for the nuclear waste tanks aboard the USS FULTON (AS-11). These included ventilation, personal protective measures when necessary and good housekeeping. (11)

9. Tricresyl Phosphate. An evaluation was made of the amount of tricresyl phosphate discharged by a vacuum pump, evacuating the insulating void around liquid oxygen containers. In order to drive-off moisture from the void, gaseous nitrogen is fed to the tricresyl phosphate which is used as pump oil. This results in a mist analyzing between 51 and 72 milligrams per cubic meter of tricresyl phosphate at (6) 1 foot downstream from the point of discharge. Recommendations for extension of the exhaust vent and/or provision of a mist eliminator have been [illegible]

made. A revaluation after installation of an oil filter cartridge element resulted in a concentration of 1.1 milligram per cubic meter. An additional recommendation calls for a revision of the procedure so as to eliminate any misting of tricresyl phosphate. (6)

10. Inhalation. The use of "Dion-Iso" polyester resin was under study for possible use in the coating of exposed metal framing in plastic fair-waters. The use of this material introduces a serious potential hazard because of the presence of dimethylaniline in the promotor/is highly toxic with a threshold limit value of 5 ppm and can be readily absorbed through the intact skin. Skin, eyes, & clothing should be thoroughly protected & water flushed when contaminated. Clothing should be removed and washed before reuse. Either adequate ventilation or respiratory protection should be provided. (19)

11. Three men reported to the Dispensary for personal decontamination after having been accidentally sprayed with Phosphate Ester Fluids. A visit to the work site confirmed the belief that the exposure experienced during this accident was negligible; however, it also indicated the need for better process controls. It was evident that in spite of previous instructions, employees were not following the exposure control measures recommended. They were re-instructed in these measures which are as follows:

a. In general, avoid skin contact and vapor, mist or aerosol inhalation.

b. Wear protective gloves, face shields, and other protective clothing, when indicated.

c. Use catch pans, containing a small amount of water whenever possible. Empty these pans frequently.

d. Clean up all spills promptly with soap and water. Use a covered container for disposal of rags.

e. Minor spills on the person should be cleaned immediately with soap and water. Employees having the material sprayed in the eyes, mouth, or over large portions of the body should report to the Dispensary for decontamination.

f. Machine parts should be cleaned thoroughly before any maintenance involving burning is attempted, and exhaust ventilation provided for such operations. (2)

12. Approximately 200 pounds of pentachlorophenol, a wood preservative and insecticide, was sprayed in the basement of the Rope- (8)

walk Building by outside contractors. Several days later Shipyard employees were found repairing sections of pipe in this area without benefit of respiratory protection. Wearing of chemical cartridge respirators was immediately required. Samples taken to determine the atmospheric concentrations of pentachlorophenol showed amounts to 0.036 milligrams per cubic meter. Although this is less than the maximum allowable concentration, even a short exposure caused irritation of eyes and mild headache, and thus reduced production efficiency. The area was posted with a "Warning" sign. (8)

13. The recommendation that methyl chloroform be used as the solvent to wipe hydraulic fluid stains from the walls of the missile room aboard a guided missile cruiser was adopted and proved successful. This cleaning procedure was preliminary to applying an epoxy resin to the same surfaces. For both the solvent cleaning and paint spraying operations, supply ventilation and respiratory equipment provided adequate protection against the health hazards involved. (8)

14. Inorganic Materials. Dust concentrations were measured during application of magnesia and fiber glass lagging. The materials are preformed to fit over pipe fixtures. During application in a confined steam tunnel, magnesia dust was always in excess of 50 million particles per cubic foot while fiber glass did not exceed five million. Respiratory protection is mandatory for the magnesia. The fiber glass is reported to cause itching, therefore skin covering has been suggested (long sleeves, high collars, etc.). (6)

15. De-Oxalum. As previously reported, De-oxalum is a proprietary product used to clean aluminum prior to welding. The use of this material originated with the Philadelphia Naval Shipyard. Further investigation was requested by the Awards Committee at this activity. Tests indicate that De-oxalum may contain secondary butanol in addition to the butyl cellosolve and acidic component. It will decompose with heat, forming considerable sulfur dioxide. There have been some complaints of a tight feeling in the chest by personnel using this material. This tends to confirm the presence of the alcohol since such complaints are common when using the higher alcohols. Therefore, it was recommended that, in addition to the eye protection specified, the material should not be allowed to contact the skin, and it should be used in a well-ventilated area or with exhaust ventilation. Organic vapor cartridge respirators may be necessary. (4)

16. Paint vapors. Investigation was made of a Beneficial Suggestion which advocated that hatches of freshly-painted compartment be propped open about 3/4 of an inch to allow air circulation. At present, freshly painted compartments are closed off and sealed. (4)

Oxygen in the compartment is depleted by the oxidation of the paint, carbon monoxide may be formed, and various contaminants are released to the air in the form of solvent vapors, oxidation products, etc. When entering these compartments there is usually considerable eye and upper respiratory tract irritation. Directives require that tests must be made by the Gas Free Engineer or his representative, and ventilation utilized as necessary before entry into such a compartment can be effected. The amount of ventilation afforded by a 3/4 inch opening produced by propping one end of a hatch cover open with a wood block would be negligible. Accordingly, the adoption of the suggestion was not recommended. (4)

17. Following receipt of reports of the presence of benzol in JP-4, samples were taken from 4 aircraft arriving for overhaul. There was no benzol found in any fraction. (15)

18. A detailed industrial hygiene survey of Shop 51 was made. Some of the operations have varying degrees of health hazards associated with them. Precautionary measures were recommended and adopted on the following operations and areas:

a. Control of fumes and dust and handling chemicals in Battery Repair Shop

b. Removal of radioactive markers

c. Handling electric plastic sealing & insulating compounds

d. Handling toxic chemicals in the Plating Section

e. Control of dust and solvent vapors in Motion Picture Repair Section

f. Control of fumes in Silver Soldering both, ICE Section

g. Installation of exhaust ventilation at buffing and grinding wheels, ICE Section

h. Operation of Detrex Degreaser, ICE Section

i. Disposal of radioactive luminous paint, Engraving Section

j. Noise sound pressure levels and frequency analyses

k. Labeling of hazardous chemicals and materials (10)

19. Several employees were having difficulty with fumes while burning out boiler tubes in a confined area aboard ship. Two employees had been overcome. Carbon monoxide was suspected and on sampling, high concentrations of carbon monoxide were found. A discussion was held at a shop supervisors meeting on the above hazard. They were instructed in the effects of carbon monoxide and reminded of the need of adequate ventilation during burning operations. (3)

20. Carbon Monoxide. An exhaust fume problem in a large aircraft assembly building was partially resolved when two large capacity diesel power units were installed in the outside of the building to supply electric power to two production lines. Prior to this, as many as 4 gasoline-driven auxiliary power units had to be used at each aircraft because of insufficient electrical capacity of the building. Under those conditions, concentrations of carbon monoxide approaching or exceeding the MAC were frequently encountered. (6)

21. An investigation was made to determine the carbon dioxide hazard from a new 35 cubic foot dry ice storage tank located in a large industrial work room. The tank was open at the top with a heavy insulated blanket covering the dry ice. Although the carbon dioxide concentration within the tank was over 25% with the blanket removed, it was never above 0.5% at the breathing level 1 foot above the tank and general room ventilation was sufficient to maintain the carbon dioxide concentration of the room air within permissible limits. It was recommended that long handled tongs be provided and used for the removal of the blocks of dry ice, thus eliminating the possibility of anyone reaching or climbing into the tank. (9)

22. Employees using teflon coated electronic wire questioned the plastic as a source of throat irritation resulting from solder operations. Due to the size of wire, type of operation, and materials used no hazard could be found in the operation. (15)

23. While welding on its exterior hull no fume generation was noted to occur within a saran-coated gasoline tank aboard an AO. Heat from the welding of outside rivet-heads did not appreciably penetrate through the two 3/4 inch plates to cause decomposition of the saran resin. (8)

24. Carbon dioxide shielded welding. Further tests were made of inert gas shielded electrode welding utilizing carbon dioxide gas as the shield. Tests were made while repairing a defective casting under a portable canopy in a dry dock. No positive ventilation was used. Natural ventilation was good. The Draeger test for oxides of nitrogen (4) indicated a trace. Carbon monoxide was negative, except over the head

of the welder in the smoke plume (100 parts per million). The welder wore an air-supplied sock hood. His protection was considered adequate. In this connection investigation was made of a Beneficial Suggestion advocating a long linear (about 2 inches by 30 inches) exhaust hood for welding with carbon dioxide shielded arcs. It was pointed out that this would be effective only for a linear weld and in no case would it prevent exposure to ozone which is formed, not only at the arc, but several feet distant from the arc by the action of the intense ultra violet radiation. The principle of low velocity-high volume air movement as suggested was correct. It was recommended that a square or rectangular hood be utilized. (4)

25. Welding within a lower deck compartment aboard a destroyer was stopped when a heavy concentration of xylene vapors was found constituting a health and fire hazard. Temporary exhaust ventilation which had been installed during the spray painting of an adjacent ammunition storage compartment had been removed before sufficient drying and to exhaust solvent vapors. (8)

26. Investigation of a number of eye "flash" burns to welders working on the inert-gas metal arc process showed that welders were not wearing protective sideshields on their safety glasses and as a result did not have adequate protection against the scattered ultraviolet radiation given off by other arcs in the work area. The need for this sideshield protection is emphasized by the increased number of "flashes" reported to the Dispensary, particularly in confined areas where welders are working in close proximity to each other. As a corrective measure it has been recommended that welders have their safety glasses, worn under their hoods, equipped with sideshields. This applies to both prescription and non-prescription safety glasses. (9)

27. Shop 11-26 recently began an extensive aluminum welding project using aluminum alloy No. 55-56 containing 5% magnesium. Sixty-one S, (61S), aluminum alloy containing about 1% magnesium was formerly used. The employees noted: (a) an increase in fumes, both by odor and vision; (b) a different light glow from the arc; (c) sparks on cleaning a hot welded area with a wire brush; (d) erythema and burning of the skin. The major health hazards associated with this welding process are ozone gas and ultraviolet radiation. Ozone gas causes nose and throat irritation and lung congestion. It can be extremely hazardous in confined areas. Ultraviolet radiation causes skin burns & visible light intensity is also increased in this welding process.

The same health hazards exist with each of the above alloys. On a comparative study, using an Ultraviolet Photometer, the ozone (3) concentration appeared to be increased with the 55-56 alloy. The increased light intensity and sparks are due to the increased magnesium content. The following recommendations were made: (a) the instructions given in BuShips Instruction 6260.4, of 10 September 1958 should be followed; (b) cover all exposed skin surface of the welder; (c) personnel with exposed body surfaces should not remain in the vicinity of the direct light rays; (d) use a No. 12 glass in the face shield; (e) welding should be performed only with adequate ventilation; and (f) ventilation should be supplemented with air supply respirators if necessary. (3)

28. Wood Preservative, Pentachlorophenol - Painters in the Material Laboratory will use this paint on the roof of the building. The cognizant supervision was advised that skin contact with, or inhalation or vapors from, this preservative should be avoided by the use of suitable protective clothing and equipment. (10)

B. Health Hazards Due to Contact with Skin

1. Experiments were recently conducted in the Shipyard in the application of 100% reactive epoxy coatings. The unusual features of the coatings are the absence of solvents and the use of diethylamine triamine adduct for the hardener. The adduct is made by reacting the diethylamine triamine with some of the resin which results in a faster curing rate. This should help to lower the vapor concentrations and reportedly results in a reduced skin-irritant potential. (19)

2. Two welders have developed rather severe dermatosis of both hands with what appears to be sensitization to chrome leather welding gloves. Standard stock unlined welding gloves have been used for a long period of time without difficulty. At present both employees are wearing cotton work gloves under asbestos mittens with good results. As soon as these skin conditions clear the use of lined welding gloves will be given a trial. (9)

3. Five employees using "Clarco" disinfectant for cleaning floors were affected by skin irritation, one severe enough to require treatment by a physician. The disinfectant is reported to contain isopropanol and chlorophenyl-phenol soap. Patch tests with the material indicate it to be a primary irritant in the recommended dilution, possible because of unreacted phenol. The use of disinfectant has been discontinued. (19)

4. A few cases of dermatitis have occurred during the quarter, some of which were traceable to possible cross-infection and others to personnel allergies or nervous conditions. The cross-infection occurred in a group of assemblers working on a single aircraft and forced into very (4) close quarters. One of the crew had a previous history of skin irritations

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or infections and observed poor standards of personal hygiene. It was significant that all other members of his crew excepting a part-time worker acquired similar conditions, two of them being severe enough to be treated at the Dispensary. Another case of allergic origin resulted in persistent skin irritation whenever the patient approached her regular working environment. A study of the materials handled failed to reveal any primary irritant. Employee was given leave for alleviation of her condition and the medical officer will see to reassigning her to a different type of environment. (6)

5. Three men reported to the Dispensary complaining of a burning sensation on their hands experienced as a result of contacting a fluid while working on an oxygen generator being prepared for shipboard installation. It was immediately determined that this fluid was a concentrated solution of potassium hydroxide leaking from a line and there was no warning plaque on the machine. It was further determined that this machine had been received containing potassium hydroxide and inadvertently stored on its side. Warning signs were posted, the machine cleaned, and it was suggested that the manufacturer be contacted in order to prevent future incidents. (2)

6. A group of sailors were becoming "sunburned" after cleaning salt water voids aboard ship. These voids are painted with bituminous paints as a rust preventive. This paint is a type of asphalt coal tar pitch. The photosensitizing effect of this paint is commonly known in shipyards. Detailed information on the subject is found in "Occupational Diseases of the Skin", by Schwartz, Tulipan and Peck. (3)

7. Two cases of apparent sensitization to epoxy resin (Palmer) were reported during the quarter. A dermatitis of the hands and forearms appeared after only a few hours of resin application to a propeller shaft. Full protective clothing, including rubber gloves , was worn. A similar operation conducted approximately 3 months earlier resulted in hand and forearm dermatitis in the same individuals during the third week of handling the Palmer resin. It was recommended that the men involved not be assigned to future epoxy jobs. (13)

8. Several employees from one of our shops used benzene to clean Mine Sweep cables before patching. The procedure used was to soak a cloth with the solvent and wipe the area to be patched. This material is extremely flammable and the vapor is very toxic. Chronic poisoning can result from daily exposure over prolonged periods. Its use can cause an irritation of the skin due to defatting effort. Chronic poisoning can also result through skin absorption. It was recommended that personnel be cautioned to prevent inhalation of the vapor and to be required to wear rubber gloves while using this material. (3)

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9. A painter developed an erythematous area after spraying "komul", a bitumastic paint. The paint contains coal tar and a tar distillates that photosensitize the skin. The painter did not use protective cream and thereby became sunburned when his skin was exposed after painting. The use of proper protective creams was suggested for all painters spraying resins.

10. A joiner applying an epoxy resin deck coating has developed a sensitivity to this resin. Employee wore rubber gloves and used protective cream on his hands; both arms were affected as well as small areas on one leg and one ankle. This employee was recently transferred here and gave a history of previous sensitization to epoxy resins. He has been assigned to other duties to avoid contact with uncured epoxy resins. (9)

11. A mixture of kerosene, white lead and trichloroethylene was reported to have caused a mild dermatitis on the hands of a machine shop employee. This mixture, used in a steel cutting process, was said to be necessary for this work and further, that direct hand contact, without gloves, was unavoidable. A recommendation that methyl chloroform be substituted for the trichloroethylene and that a protective hand cream be used, was accepted. (8)

12. Five cases of dermatitis occurred during the application of epoxy resins. Investigation revealed that in four cases there was a disregard of the health procedures established for handling of epoxy resins. The other employee was found to have been sensitized to the resin and was removed from further exposure. The remaining four cases were given treatment and additional indoctrination. (11)

II. Physical Health Hazards

A. Exposure to Excessive Heat

1. A study was made of the upper sections of the Machine Shop to determine temperature and humidity conditions existing during the summer months. Although the results did not indicate serious adversity recommendations were made to improve working conditions to maintain production efficiency. (8)

B. Exposure to Nonionizing Radiation Hazards

1. During this quarter the nuclear reactor of SSGN-587, USS HALIBUT, was brought to initial criticality and the reactor and associated systems were successfully tested at all power levels. No unusual or severe health physics problems developed. None of the workers acquired more than a minimal exposure to ionizing radiation. (2)

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2. Microwaves. Under the provisions of a BuMed Instruction requesting eye examinations of radar employees, all the personnel in the radar shop were so examined. Two (2) employees were found with abnormalities; one (1) showed cataracts of both eyes which may have been orginally produced prior to his employment at this Station, however, he indicated previous experience as a radioman in the U. S. Navy; the other showed certain opacities of senile character. A survey of their work areas with a germanium diode tester indicated microwave intensities in the order of 0.001 to 0.004 watts per square centimeter during operation of a powerful radar set in a separate area of the shop. Both employees were transferred to "cooler" areas of the shop and were further shielded with metallic partitions resulting in no reading in the detector.

Stray radiations were found in the radar shop as indicated in the paragraph above. These were judged to be within the accepted limits of microwave exposure and resulted from reflections or refractions of microwave beams directed to outside targets through glass windows. Structural members of the building caused some of these rays to bounce back. Recommendations have been made to install absorbing screens around radar antennas in such orientation as to prevent the bounce-back effect. (6)

3. As a practical safeguard to avoid excessive exposure to radar waves, Neon Lights (N. E. 51, Stock #GF. 6240.223-9100) are being used. These neon lights will glow when exposed to microwaves producing approximate energy of 5 or 6 milliwatts per square centimeter which are below the threshold limit of 10 milliwatts per square centimeter. (20)

4. Radar Modulator Unit An-SPS-29, containing high voltage Thyratron Tubes (12 kvp), was monitored aboard the USS MANLY for presence of x-radiation. Readings were taken using "Cutie Pie" ionization chamber encased in a "cage" covered by a double-thickness aluminum screen to prevent RF interferences. Readings in the compartment and in front of the modulator unit with doors open were less than 1mr/hr. Film badges placed on the inside of door panels and on one operator represented 6-8 hours exposure, film badge (duPont 552 packet) readings were negative.

5. Since instrumentation is not available to continuously monitor the area in the vicinity of the antenna where shipyard cranes are required to operate, it is desirable to provide these crane operators with a qualitative measuring device that will show the presence of microwave radiation in the energy range that may constitute a health hazard for continuous exposure. (12)

It is known that miniature neon lamps, such as the GE series NE-51 will glow in the presence of radar microwaves in this energy range. It is recommended that they be installed against the outside front glass window of the cab in full view of the operator. (12)

C. Exposure to Excessive Noise

1. Acoustical measurements on several hydraulic test benches indicate that generally ear protection is needed by the operators of such equipment. The noise exhibits one or more peaks in some octave bands which indicates that either pure tones or narrow frequency ranges exist and thus render the noise more hazardous. For instance, a bench with a measured level of 98 decibels has a hazard equivalent to 108 decibel level. It is felt that wearing of ear plugs is advisable for most of the personnel in the vicinity of these benches and it is mandatory for the operators. This situation presents a difficult enforcement problem and is best solved by installation of acoustical shields when funds will be available. (5)

2. Under the hearing conservation program it is intended to have information on the hearing of every industrially employed person. Overall audiometric surveys of large segments of the Station conducted on a division-wide basis have been initiated. Three divisions have been completed with another one in process. (6)

3. Measurements were made in the metal building at the O&R Jet Test Cell Area. Employees inside the building complained of vibrations in the chest as a result of the operations. The noises were not found to be excessively high for operations of this type. Personnel were informed the vibrations are not injurious and ear defenders are required during the operation. (15)

4. Modification of an existing test cell to accommodate the J-57 engine with afterburner was completed recently. An evaluation of sound attenuation was made by Sound Control Incorporated; sound reduction was not acceptable. Design of the engine support was such that the engine exhaust was approximately 10 feet from the attenuator inlet. Modification is in progress to permit operation essentially as designed. (16)

5. Preliminary checking on the effectiveness of a (Maxim Div. of Emart Company), portable sound attenuating device was done utilizing the A4D-1 aircraft (J-65 engine). It was found that sound intensity was increased forward and the side; and decreased aft of the muffling device. Tail pipe temperature was elevated about 12° probably because of back pressure built up by entry resistance. Alignment was imperfect (inherently so with this attenuator and the A4D) and the attenuator entry grill is of significant area with a consequent build-up of temperature. Indications are that portable mufflers or attenuators of this design are not usable withhout considerable modification. (16)

6. A noise study was conducted at the Ground Control Approach Facility located near the intersection of the two main runways in the direct path of noise produced in the flight test line, 1500 feet away. A continuous recording indicated a weighted average overall noise of 92 decibels with peaks varying from 108 to 117 decibels. The 20 military persons attached to that facility have been included in the audiometric program and hearing protection has been recommended. (6)

7. Several estimates were made of the expected free-fiedl noise produced by the Regulus II missile utilizing data issued by the manufacturer of other naval sources. It was concluded that noise of the order to 150 decibels may be encountered in areas where personnel will have to perform certain adjustments. Recommendations were made to add water cooling to a standard portable aircraft exhaust muffler, so as to enable afterburner runs exceeding the capability of the muffler. Actual noise readings of the Regulus II made subsequently at Point Mugu indicated the noise to be of the 140 decibel intensity. (6)

8. An attenuation pad consisting of a length of cable and two plugs to be inserted in the corresponding sockets of a sound level meter was manufactured with the assistance of the Navy Electronics Laboratory, San Diego. The device provides 30 decibels attenuation thus extending the range of the sound level meter to 170 decibels. (6)

D. Illumination Problems

1. Due to complaints of excess glare from military personnel a survey was made of an office located on an outlying field. Lighting is furnished by overhead fluorescent fixtures equipped with diffusers and furnishing a minimum of 30-40 f.c. of light on the working surfaces. The walls are painted a cream-yellow. Work in the office is done on yellow cards and visual difficulty is encountered due to poor contrast. In order to reduce glare it was suggested that the walls be painted with a dull finish, light green paint. (15)

2. A program for the relamping of certain production areas has been initiated. A survey was recently completed in the second floor of an industrial building where light levels were low, requiring considerable amount of auxiliary lights. At this time the general level of illumination was found to be in excess of 50 footcandles. Because of the extremely high visual demands of certain operations many of the auxiliary lights were recommended to be retained to yield levels in the 100-200 footcandles suggested by the Illuminating Engineering Society for similar tasks. (6)

3. Glare from Fluorescent Red Orange Paint, Color 633, Hi-Visibility, was resopnsible for eye fatigue among several of the 30 spray (20)

painters using this type paint. Tinted glass protective eyewear was recommended as suggested by BuMed and BuAer. Personnel also complained that difficulty was experienced in removing the fluorescent paint from the skin. Protective skin cream (Ply #2) and SBS #30 waterless skin cleanser were recommended and used with good results. (20)

4. Large grinding machines are located on the hangar decks of carriers undergoing conversion. The illumination appeared inadequate. Measurements were taken of the illumination furnished by the lights localocated on the grinding wheel shield. The intensities on the tool rest ranged from 20- 4. footcandles, apparently depending on the type of bulb installed. With the grinder lights turned off, no detectable reading could be obtained on the light meter, indicating that general illumination was practically non-existent. This created a hazard because it is required that lights be turned off when the machine is not in use. A person approaching the machine could not tell whether the grinding wheel was still rotating from previous use or not. The latest recommended illumination intensity for rough rinding is 100 footcandles to be furnished by combination of general and supplemental illumination. It was therefore recommended that the bulbs installed on the grinding machines be of a type to furnish a maximum possible illumination and that general illumination in the area be provided at a level of at least 30 and preferbly . 50 footcandles. (4)

III. Ionizing Radiation Health Hazards

1. A survey was made to determine the radiation level in unrestricted areas in the Material Laboratory around Radiographic Room #310. Radiation levels were measured during lead camera type and open source exposures using a 500 mg. radium source. Lead shielding was varied to determine the reduction in radiation levels obtained by the use of various types of lead shielding. Data obtained from the survey (10) disclosed the following:

a. Camera Type Exposures. The maximum radiation levels recorded in the unrestricted areas was 0.28 mr/hr with the camera elevated at 15 inches above the floor. The camera was shielded on the bottom at floor level with 12 x 16 inch area of 2 inch thick lead bricks and with a 4x8x2 inch lead brick on top.

b. Open Source Exposure.

(1) The maximum radiation levels recorded in the

unrestricted areas were 5.0 mr/hr with the source 15 inches above the floor and shielded by an area of 12x16 inches of 2 inch lead bricks on the floor directly below the source and an area of 10x10 inches of 2 inch lead bricks 15 inches above the source. This shielding is understood to be standard practice.

(2) Measurements made after adding 1½ inch thickness of lead covering an area of 5x5 feet under the 12x16x2 inch lead shield resulted in a maximum recorded level of 1.1 mr/hr in the second floor area directly below the source. This is the same location where the 5.0 mr/hr reading had been previously obtained.

The results obtained from this survey indicate that it is permissible to use the camera type of exposure at any time of the day since the shielding provided attenuates the radiation level to a value below 2 mr/hr in unrestricted areas as required by the Atomic Energy Commission. In regard to the open source exposure, this type of operation is permitted only during off hours providing shielding as indicated in subparagraph b (2) above, adequate portable panel shields installed between the source and the north, west, and east walls of Room #310 and adequate shields above the source are maintained. This shielding is required to retain the "unrestricted" ratings of other areas around Room #310. In regards to the shielding required above the source, it is considered that an additional ½ inch thickness of lead used together with the 2 inch bricks presently employed will assure compliance with the Atomic Energy Commission regulations. It was understood that a new method of shielding will be provided in the near future. This shielding will be placed closer to the source. The effect of the new type of shielding will be surveyed and if found satisfactory will then be used as standard in open source exposures. It was recommended that supervisory personnel check and approve the application of shielding prior to exposing the various sources to assure maximum safety of laboratory personnel. (10)

2. This office assisted Code 74 of BuMed in exposing film badges to AN/SPS-8A and Mark-25 radar scopes. Duplicate film packets on the AN/SPS-8A exposures were forwarded to the Commanding Officer, Naval Medical Research Laboratory, Bethesda, Maryland. Dosage recorded on duPont 552 film was not detectable even on film placed on the antenna for 15 minutes. Pocket dosimeters (IM-9D/PD-200 mr scale) were placed in all locations for the same time interval; no dosages (less than 1 mr) were observed. (12)

3. Radioactive Luminous Paint Containing Radium Salts. Radioactive luminous paint has been used by the Engraving Section of Shop 51 to paint numbers on telephone dials. Since this paint is no longer used the shop on recommendation of the Medical Department disposed of it through an Atomic Energy Commission approved waste disposal (10)

concern. Measurements with radiac set AN/PDR-27 revealed traces of radioactive residues where parts had been stored, mixed or used. All areas where contamination was found were wiped by an employee wearing rubber gloves, using small squares of cloth wetted with a wash solution containing a detergent and chelating agent, Versene. More stubborn areas were scrubbed with a 1-inch square brush and then wiped repeatedly. Some areas, such as those on porous wood which could not be cleaned as above were removed by sawing away around that area and removing that section of wood. This procedure was also followed in the case of a linoleum-topped table and a masonite covered work bench. All cloth used, brush, sawed-off pieces and rubber gloves were collected in a plastic bag and disposed of in a radioactive disposal can in an unfrequented open area to await removal by a disposal contractor. All areas were cleaned until the reading was less than 0.05 mr/hr and a wipe test using damp filter paper showed no removal of radioactivity from the surface.

It was recommended that radioactive material, chemicals or paints should not be used until the Industrial Hygiene Division has investigated proposed use and recommended control measures necessary to minimize exposure of personnel and contamination of work areas. (10)

4. Colbalt 60, Cesium 137 and Radium 226. New carrying cases are being built for the radioisotopes used for shipboard radiography. These are designed to conform with U. S. Atomic Energy Commission, AECU-2967 Radiation Safety in Industrial Radiography with Radioisotopes. This specified that the level of radiation from gamma emitters should not exceed 200 mr/hr at the surface of the outsdie of the container and/or 10 mr/hr at a distance of one meter from the source. One carrying case built to carry 2,000 millicuries of cesium 137 has been completed and was checked for compliance with the requirement. A Gamma meter read 200 mr/hr at the surface of the container. As other containers are built they will also be checked for conformance with AECU-2967. (1)

5. Platonium 239. A barge used for the disposal of radioactive waste at sea became contaminated from a leaking container. A cement block approximately 4 feet square and 8 feet long was delivered by truck to the enclosure reserved for the storage of radioactive waste. Soluble plutonium apparently percolated through the cement, contaminating the truck bed and eventually the barge.

A survey of the 5 hopper areas of the barge was made to determine the extent of contamination. The contaminated barge areas were heavily rusted. When taking samples it was noted that surface readings were reduced about ten times by scraping with paint scrapers. Total contamination was estimated to be about 100 microcuries located for the most part in two of the five hoppers. (1)

Decontamination of the most highly contaminated areas by scraping appeared to be possible. A vacuum cleaner was designed and built from commercial vacuum cleaner parts and sheet metal. A second vacuum cleaner was borrowed from the Naval Radiation Defense Laboratory. The filters installed were capable of filtering out particles down to 0.3 microns in diameter.

The barge was drydocked and allowed to dry out. Areas of contamination in excess of 500 d/m/150 square feet were outlined with chalk. Heavy Kraft paper was laid over the bottoms of the hoppers and secured to the edges with pressure sensitive tape. The marked areas were scraped a square foot at a time. The scraped surfaces and the surface of the Kraft paper were then cleaned with the vacuum cleaners. Occasional slight contamination was found on the booties worn by personnel entering the hoppers.

All personnel entering the hoppers were required to wear Scott Pressure-Demand air supplied respirators. These respirators were found to be excellent for both protection and comfort.

After the highly contaminated areas were decontaminated the hoppers were wet sandblasted. Air contamination during sandblasting was well within the maximum permissible concentration for airborn plutonium.

A complete report can be obtained by writing the Industrial Hygienist of the Command. (1)

6. A radiological environmental survey has been initiated in order to establish the background levels in the Pearl Harbor area. Samples of air, potable water, harbor water, soil, vegetation, and harbor mud, are collected periodically and examined for gross beta activity. The frequency of sampling has been limited by the lack of adequate personnel and equipment, but it is expected that these deficiencies will be corrected within the near future. (19)

7. A group of 10 Passive Defense trainees were engaged in certain exercises involving isotope handling. Photodosimetry indicated total exposures varying from 0 to 0.02 milliroentgens. (6)

8. Because of the very infrequent use of the Radium Painting room, it was planned to make that area available to an instrument shop and to remove or tie-up part of the present exhaust ventilation system (6)

to the instrument shop ventilation which will operate with a large degree of recirculation. This proposal has been strongly opposed because of the possibility of diseminating residues that may exist in the present system and because there is still need for limited radium handling facilities. (6)

B. X-Rays

1. Ten (10) film badges were given varied exposures to a known amount of x-ray radiation using an AN/PDR 2 radiac set. On developing and reading the film badges the error was found to be about 10% on the high safe side. This was probably due to using exposure graft No. B 552-180 with film No. B 552-205. This information was discussed with the Industrial X-ray Technicians. They appear to have an increased confidence in their film badge radiation exposure results. (3)

C. Alpha Particles

D. Gamma Particles

1. During trial operation of ANSPS/29 radar unit aboard ship, film badges were posted on and around the power components, as well as on Electronic Ship personnel working in the area as a protective measure against the possible over exposure to X-- radiation. Films evaluated after 2 to 3 hours of exposure revealed little or no density readings above control films, while film exposed for approximately 40 hours indicated up to 0.03 roentgens of X-- radiation. (8)

E. Isotopes

1. This shipyard became aware that under the Atomic Energy Commission license for operating the various radioactive isotopes, the disposal of low level wastes even if performed in accordance with NAVMED P-1325 is a violation of Title 10 of the Federal Register (Chapter 1, Part 20). Consequently this office recommended the contracting of an AEC authorized contractor for disposing of this waste. It is believed that the contractor, Nuclear Engineering Corporation, Kearney, New Jersey, is performing a function more expeditiously and economically than has been done in accordance with Bureau directives. (12)

F. Radioactive Waste Material

1. Because of security requirements, the previous radiological disposal area had to be relocated at a point beyond certain distance from a classified installation. The new area was cleared of underbrush, surrounded by a wire fence and a pad-locked gate and will enclose the reinforced concrete cylinders where radioactive waste material is deposited for final cement sealing and ocean disposal. Since the previous area (6)

was active from the time the liquid wastes were disposed, a very small level of ground contamination exists. Therefore it was recommended that the previous area be left as is, without access to any unauthorized person, and that it be permanently charted as contaminated in all future condition maps. Two (2) employees are currently collecting and disposing of radioactive waste material, mostly electronic tubes. Their photodosimetry was normal. (6).

IV. Shipboard Industrial Hygiene Surveys and Investigations

A. Surveys

1. A ventilation survey was made on a ship under conversion. Readings from a number of 5 inch flexible tubes indicated an average ventilation rate of 456 cfm. The method used to obtain this ventilation rate may be of general interest. Seven (7) platforms are installed along the hull at the third deck level to hold the ventilation machinery. Holes for 16 inch ventilation ducts are cut in the hull of the ship. These are joined to vertical 16 inch ducts which extend from the main deck to the tank tops. Each level has four to six branches as required for attaching the 5 inch ventilation tubing. The system was designed so that any part of the ship could be reached with 60 feet of 5% ventilation tubing. (1)

V. Substitution of Toxic Solvents by Less Toxic Material

VI. Notes

This section will include items of interest ranging from the scientific to the social aspects of the Occupational Health Program.

A. Miscellaneous

1. Investigation of contamination of Liquid Oxygen (over 30 ppm $CH_4$) revealed that the Samplers were contaminated with $CH_4$, $CO_2$ and $N_2O$ as analyzed with the Beckman Infrared Spectorphotometer IR4. After proper purging no contamination was found in the samplers. The Samplers were procured from the Naval Air Station, Alameda, in a contaminated state. BuAer was notified to alert other activities that might have received the same lot of Samplers. (20)

2. A considerable part of the Industrial Hygienist's time, in addition to their most important function (to evaluate environmental occupational health hazards and recommend engineering and personal control measures for the prevention of illness and absenteeism), is occupied in investigating conditions alleged to be uncomfortable or health hazardous. These investigations are important. They often result in preventing (15)

unjust compensation claims by producing facts substantiating the lack of basis for a complaint. In practically all instances these investigations of complaints or alleged health hazards result in alleviating fear of employees and thus contributes to production efficiency and morale. Following is an example of such an investigation:

A crystal etching shop (ammonium bifluoride solution) has ceased operations and the work space has been used by an electronics shop for a number of months. Several employees complained of nausea on a Saturday following a routine work week. The area was cleaned before operations transferred and only the sinks are in place. No complaints of this type had been made during the previous years the shop was used. Personnel were informed symptoms could not be caused by hazardous conditions in the shop. (15)

3. Enlisted personnel aboard the Norfolk Reserve Fleet became intoxicated due to lack of proper protective equipment while spraying. Proper protection and ventilation requirements were enumerated to the personnel in order to prevent the condition recurring.

4 The Gyro-Compass Shop was razed in a beautification program. While most of the rubble was still on the site, the area was monitored for mercury vapor in the air. The air concentrations ranged from .0 to 0.4 $mg/m^3$ using a Kruger Mercury Vapor Detector Model #23. Chemical analysis of the dirt in the building revealed only micro quantities present. Years ago the building had been used to manufacture antifouling paint when mercury oxide was a common ingredient in that paint. After clearing the area and leveling the ground, dirt samples showed no mercury nor was there any air concentrations in the air concentrations in the area. A Beneficial Suggestion recommending that the demolished building material be specially handled due to the mercury hazard was returned disapproved. (12)

5. Malfunctioning of sensitive guidance instruments has been attributed to the presence of dust particles in the system. Because the presence of particulate matter in atmosphere is one of the possible sources of these particles industrial hygiene methods were used to determine the dustiness of the air in a new, air conditioned, instrument shop. The dust counts ranged from .75 to 2.5 million particles per cubic foot of air. The dust electrostatically precipitated on a hemocytometer cell ranged in size from submicron particles to pieces as large as 500 microns. These values are far in excess of the criteria for the instrument shop which specify less than 0.25 million particles per cubic foot of air with the particles not to exceed 0.3 microns in size. This excessive dust loading is, of course, not significant in terms of a health hazard, but is tremendously important in terms of the integrity of the aircraft (5)

instruments or of guidance systems. Thus, by applying standard industrial hygiene methodology it was possible to locate the dust sources within the shop, as well as other channels of entry and to make recommendations for changes in work methods, relocation of potentially dusty or particle generating processes, improvements in the air cleaning systems, etc., which will result in the eventual control of this problem. (5)

6. Urinary leads were performed on a weekly basis for a group of men cleaning gasoline tanks on an outlying island. This laboratory work was considered highly desirable because of the occurrence of several cases of lead poisoning on the previous occasion when these tanks were cleaned. Samples were shipped by air in polyethylene bottles and arrived without spillage or leakage. All lead values were within normal limits, and no symptoms of lead poisoning developed during or after the tank-cleaning job. (19)

7. A case of metal-fume poisoning occurring during shipboard welding on galvanized material is believed to have been due to an unauthorized change in the temporary ventilation set-up. One of the two "suckers" used in the area was reversed so as to blow air into the compartment to provide a more comfortable working environment. The cross currents so produced interfered with fume collection by the remaining "sucker". Supervisory personnel are taking steps to prevent a recurrence of such an unauthorized change in ventilation set-ups. (19)

8. A request was received from the Fairmount Glass Works of Indianapolis to advise on heat control at their glass manufacturing operations. The request was peculiarly channeled through the Secretary of Defense on down to this Command. A letter giving general guidelines on the control of radiant heat which was judged to be the major contributor to the problem and references for literature and specialists that may be directly available to the Indiana glass industry, was prepared for the signature of the Commanding Officer. (6)

9. A paper presented at the meeting in Chicago indicated that propane gas may contain too little odorant to warn of explosive mixtures. This information was imparted to the Shipyard since we use propane at this activity. Tests are underway to determine the concentration of the odorant in the local propane. (4)

10. An instruction for labeling of hazardous chemicals has been published by the Naval Air Basic Training Command, and will be implemented by subordinate activities at an early date. (15)

11. A Beneficial Suggestion was investigated which advocated revision of several of the Navy-wide standard labels. It was found that writing on some labels is illegible because of the color of the (4)

label. The Beneficial Suggestion was approved. However, it was noted that these labels are Navy-wide in distribution and must be changed by the originator of the present system. (4)

12. A leaking drum of hydrofluoric acid Stock No. G6810-236-5671 was reported from the Supply Department bulk storage area. Investigation revealed that 5 additional drums were potential leakers as indicated by bulging and general appearance of the drums. These 6 drums were drawn and used by the plating shop. Stock quantity will be limited not to exceed a normal 6 months supply with isolated storage in a well ventilated area. Personnel in the area have initial indoctrination on potential hazards, preventive measures and first aid procedures. (16)

13. We are attempting to maintain a continuous health educational program for our asbestos workers. The shop has been most cooperative in this effort. The film, "The Air We Breath", was obtained from MSA and shown on four occasions to small groups of these employees. This educational movie was followed by a short discussion of the hazards of breathing asbestos fibers and the use of dust respirators. (3)

14. A Safety Order was written providing specific instructions for the storage, use, handling, and cleanup of mercury. In each section of the instructions it was stressed that the basic principal of controlling exposure to mercury is containment. (2)

15. A pre-operational environmental survey for background radiation levels in the Shipyard area was initiated July 1st, in preparation for future nuclear submarine overhaul. Air, river water, potable water and rainfall samples are being collected. The Shipyard program is coordinated with a State Health Department survey which will cover areas outside the confines of the Shipyard. A total of 8 weeks of on-the-job training in radiation protection procedures is being received by three members of the Industrial Hygiene Division at Portsmouth Naval Shipyard in conjunction with the Nautilus overhaul. (13)

16. The U. S. C. Safety Supervisor requested information about the hazards involved in cleaning up a dry spill of Calcium Hypochlorite. It was recommended that the Calcium Hypochlorite be removed by dry methods and that workmen doing the cleaning be provided with respiratory protection (1)

B. Personal

1. An excellent article titled, "Radiation Hazards Aboard A Guided Missile Cruiser", by Johnson, W., Kindsvatter, V. H., and Shaw, C. C., appeared in the United States Armed Forces Medical Journal, (BuM)

Volume X, No. 5 of May 1959. Victor H. Kindsvatter is the senior civil service industrial hygienist of the medical department of the Philadelphia Naval Shipyard. Several other industrial hygienists have had articles published in such periodicals as the Armed Forces Medical Journal, Safety Review, and professional industrial hygiene publications in the past year. Among these are Mr. Ernie Storlazzi of Boston Naval Shipyard, on welding; Dan Bessemer of Bremerton Naval Shipyard, in ventilation control of duplicating processes; Harry Gilbert, New York Naval Shipyard, on inert gas electric welding; Alfredo Salazar, Naval Air Station, San Diego, on industrial hygiene surveys in "Safety Review", to mention a few. Beginning this year - 1960 - the Notes will list the articles and publications, so that readers of these releases will be informed of articles published by U. S. Navy officer and Civil Service Industrial Hygienists.

2. An article by Mr. Jack McElhiney, senior industrial hygienists of the San Francisco Naval Shipyard, on an unusual experience in the decontamination of a radioactive waste disposal barge will appear in the Naval Medical News Letter, Volume #35, No. 3, of 5 February 1960.(1)

3. Mr. Charles P. Bergtholdt of the Naval Weapons Plant, Washington, D. C., has developed an interesting and effective pictorial presentation of the industrial health program conducted at the Weapons Plant. The presentation consists of attractive posters depicting the various services and functions of an occupational health team. (18)

4. Ships and those naval activities not having industrial hygienists attached can obtain the services of a qualified industrial hygienist for a periodic industrial hygiene survey by requesting the Commanding Officer of the nearest naval activity having an industrial hygienists, for this service. Requests are processed via the cognizant District Commandant, (see NCPI 88.8-4) and Manual of the Medical Department (CH 26-10). Any financial arrangements required are made by the Commands. During the quarter some of the surveys reported are as follows:

| | |
|---|---|
| Bermuda<br>USNAS Oceana | Mr. Herbert J. Worsham |
| NAS Whidbey Island | Mr. D. J. Bessemer |
| Naval Research LAB | Mr. Ray McClure |
| USS HOLMES COUNTY (LST 836) | Mr. Alfredo Salazar & Harry Utes |
| ARC- Cable Layer Ship | LCDR Wm. H. Dentler, MSC, USN |
| USN Underwater OrdSta, R.I. | Mr. Salazar DiLustro |

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| | |
|---|---|
| USN STA Key West | Mr. Roland Byrd |
| Medical & Dental X-ray aboard ships berthed in Shipyard - Norfol | Mr. Seymour Levinson |
| NavSupCen Oak .nd | Mr. Jack McElhiney |
| USS ANTIETAM Survey | CDR Ray Nebelung, MSC, USNR |
| USN TraCen, Bainbridge | LT C. J. Jordan, MSC, USN |

5. A survey was made by the Norfolk Naval Shipyard industrial hygienists of the concentration of mercury vapors in the Cardio-Pulmonary Function Laboratory at the U. S. Naval Hospital, Portsmouth, Virginia. (12)

6. A noise survey is being conducted aboard the USS ANTIETAM. Sound measurements are being made at various locations on the flight-deck and throughout the ship. (15)

7. The industrial hygiene division of the medical department, Portsmouth Naval Shipyard, has expanded considerably to provide the extensive monitoring, laboratory, and industrial hygiene advisory services necessitated by refueling and overhaul of the SS(N) NAUTILUS and completion of the nuclear powered submarine &SS (N) SEADRAGON. To provide industrial hygiene coverage on a three shift, seven day week basis, has required a division staff total of fifty-one,- forty-four of whom were directly employed in the radiological health monitoring and the rest for supportive laboratory and general industrial hygiene duties. To supplement the small permanent staff, 34 Production Department employees were detailed to the division and trained for radiological monitoring work.

There are several principle radiation or contamination areas subject to industrial hygiene monitoring control. At the USS (N) NAUTILUS for work in the reactor compartment a personnel change barge has been provided.

This barge contains facilities for issuing protective clothing, film badges and dosimeters, a clothing change area with lockers, and a health physics room with facilities for industrial hygiene survey instruments, laboratory bench for scalers to count air samples, swipes, and other samples, and located to enable control of personnel both in and out of the lower reactor compartment. This is the control point of industrial hygiene service for the NAUTILUS overhaul. All work areas are continuously monitored for radiation level, air concentrations, and surface swipes for loose contamination. All personnel leaving contamination (9) areas are monitored to assure radioactive cleanliness, and all equipment or waste is monitored and appropriately tagged. (9)

8. Herman Schulz, formerly associated with the New York State Department of Labor, Division of Industrial Hygiene, has been appointed to fill the vacancy of Assistant Industrial Hygienist. (10)

9. Four new positions have been established in the Industrial Hygiene Division of the Medical Department for the following: Industrial Hygienist, GS-11, Health Physicist, GS-11, Radio Chemical Technician, GS-7, and Clerk Stenographer, GS-4. It is expected that the positions will be filled within the next quarter. (19)

10. Courses of instructions in Industrial Health were given classes of Flight Surgeons and Aviation Medical Technicians at the School of Aviation Medicine. (15)

11. Mr. Harry F. Roegner reported aboard as an industrial hygienist trainee on 24 August 1959. (4)

12. The annual industrial hygiene survey of the U. S. Naval Underwater Ordnance Station, Newport, Rhode Island, was conducted by the Industrial Hygienist of the Naval Air Station, Quonset Point. (20)

13. The industrial hygienist recently spent two weeks at the Portsmouth Naval Shipyard in on-the-job training in the Industrial Hygiene Division of the Medical Department, for nuclear work. An opportunity was afforded to observe the procedures for contamination control and personnel protection during overhaul work on the NAUTILUS. Information was also obtained on the organization of the Health Physics Branch, personnel matters, field and laboratory equipment, analytical procedures, dosimetry, medical clearance, waste disposal, and limits of exposure and contamination. (19)

14. Radiac coordinators from various shipyards and other naval installations visited this shipyard for training in regard to the neutron calibrating range developed here. A brief talk was given on the Health Physics aspects of the range. (2)

15. Included in a Middle Management upervisor raining ourse were talks by the Industrial Hygienists and the Health Physicist to acquaint the trainees with the philosophies, terminologies, and activities of the respective disciplines. (2)

VII. Composition Data ( information will be found on separate page)

VII. Composition Data

A. The following data is to be treated as "Commercially Discreet" information and is to be used for official purposes only:

1. In accordance with SECNAV Instruction 6260.3 and BUSHIPS Instruction 6260.3 on labelling toxic materials. The following new materials were introduced into the shipyard and assigned a label accordingly:

Penetone Formula 426 - cresylic acid 15%, chlorinated solvents 45% label BuSandA 9987.

Pero-Klean Marine Cleaner #801 - high flash aromatic hydrocarbon oil, label BuSandA 9987.

Miracle Mastic Type P - solvent is Petrolene, label BuSandA 9988.

Hy-Temp Block Insulation - diatomaceous earth 63-70%, asbestos fiber 12-15%, no label.

Foster 81-33 Fire Resistive Adhesive - xylol 41.5% by volume, alkyd short oil 23%, BuSandA 9988.

Carlon PVC Cement and Primer - tetrahydrofurance 56%, label BuSandA 9988.

Fabertite - Contains coal tar, label BuSandA 9987. (12)

2. Other products:

Pressure Sensitive Tape, No. 428C, manufactured by the Minnesota Mining and Manufacturing Company contains no ketones, phenols, aldehydes or other material that would be suspected of causing skin irritation or sensitivity. (9)

Porselon #600 is a two component coating manufactured by Protex-A-Cote Incorporated. Segment #1 contains 50% resin and 50% technical grade amyl acetate by volume. Segment #2 contains 50% aliphatic amine and 50% amyl acetate by volume. The combustion products would contain amines, carbon monoxide, carbon dioxide and cyanides. (9)

Formula 121X paint. This formula contains more solids than Formula 121 and in addition contains a significant amount of tricresyl phosphate. (4)

Aircosil Flux. Used in silver soldering. Qualitative tests for boron were positive. Fluorides were present (approximately 10%). PH of the mixture is about seven. It contains about 65% water. Appears to be similar to Handi-Flux which contains about 11% fluorides and has a pH of 6.6. Flame tests showed no sodium or calcium. (4)

Pitt Chem Thinner - manufactured by the Pittsburgh Coke and Chemical Company is a high boiling heavy grade solvent naphtha (aromatic). (9)

Glass Cote Sealer - distributed by Robert J. Elliot, Boston, Massachusetts, was found to contain excessive amounts of Xylene. No precautionary measures for use of this material was stated on the label. (8)

Durapox - a two component epoxy resin product is manufact red by the Durant Paint, Incorporated, Revere, Massachusetts. Durasol is the name of the associated polyamine hardener. (8)

Stripper C86-67D. Turco Products Co. Contains 48% sodium monosilicate pentahydrate, 48% sodium trisilicate and 4% sodium resinate and cresylic acid added. (6)

Cleaner, Mil-C-16553, Type I - A clear solution of ammonium and amine soaps with or without a hydrocarbon solvent. (6)

Acrylic cellulose - nitrate lacquer, Mil-L-19537 - Methyl methacrylate, diisooctylphthalate, ketone, alcohol, toluene. (6)

Denatured ethyl alcohol, JAN-A-463 - Ethyl alcohol to which has been added dye or denaturant (C-1 grade). (6)

Potting compound MIL-S-8516B - Base, polysulfide rubber, 55% in aromatic hydrocarbon. No benzene shall be used. (6)

Turco 2822. Turco Products Company - A general paint remover and desealant for neoprene and thiokol adhesives. Contains chlorinated hydrocarbons. (6)

Acrylic lacquer, Mil-L-19538 (Aer) - Methyl ethyl ketone, methyl isobutyl ketone, octane, isophorone; cellosolve acetate, toluene, nitrocellulose compounds, methyl methacrylate, dioctyl phthalate. (6)

Acrylic thinner, Mil-T-19544 (Aer) - Cellosolve acetate, 20%, methyl isobutyl ketone, 40% and toluene 40%. (6)

Alodine 1200 - Mixture of chromic acid, simple and complex fluorides and phosphoric acid. (6)

Black phenolic resin, Mil-R-3043 - it shall not contain chlorinated compounds or benzol and shall not have an irritating or nauseating odor. (6)

Camouflage lacquer, Mil-L-00630B - a cellulose nitrate lacquer. (6)

Cellulose nitrate lacquer, Mil-L-7178 - Non-oxidizing phthalic alkyd resin, diisooctyl phthalate butyl acetate, ethyl acetate, butyl alcohol, toluene, naphtha. (6)

Cellulose nitrate thinner, T-T-T-266A · may contain methyl isobutyl carbinol, methyl ethyl ketone, methyl isobutyl ketone, toluene. (6)

Cellulose acetate butyrate dope, Mil-D-5551D - Cellulose acetate butyrate, plasticizer, butyl acetate, diacetone, ethyl acetate and methyl ethyl ketone. (6)

Cellulose acetate butyrate thinner, Mil-T-6097A - Butyl acetate and diacetone alcohol. (6)

Compound grease cleaning solvent, "gunk:, Emulsion Type II, Phenolic. Fatty acid soap 51%, cresylic acid 16%, butyl alcohol 1%, hydrocarbon oil (Kerosene) 32%. (6)

Day Glo fluorescent paint, Mil-P-21563 (Aer) - Acrylic resin and aromatic thinners. Contains no ketones, cellosolve acetate or mineral spirits. (6)

Deoxidene - Phosphoric acid (75%), butyl cellosolve and 1% nonionic wetting agent. (6)

Nacconol detergent wetting agent - Sodium alkyl aryl sulfonate. National Aniline and Chemical Company (6)

Nubelon enamel (Glidden Paint Co.) - A silicone epoxy paint with accelerator added. Cures at 425 - 450° F. (6)

Parko Lubrite - Phosphoric acid for surface treatment (205-210° F.)

Nokorode 731 - referred to locally as Paralketone, Mil-C-16173A Corrosion preventive solvent cut back. · skin irritant. 60% asphaltic base, 40% mineral spirits. Lion Oil Company. (6)

Polyurethane (Magna) S.&W. (Sherwin-Williams Co.) - Polyisocyanate reacted with hydroxyl bearing resins in a solvent system, reported as non-toxic and non-irritating. (6)

Preservation oil, Mil-O-6083 - a petroleum base oil with tricresyl phosphate and inhibitors. Tricresyl phosphate is a toxic material. (6)

Preservation Oil AN-C-124C - a corrosion preventive compound (non-volatile) dispersed in petroleum solvent. Benzol and chlorinated hydrocarbons are excluded. (6)

Pretreatment coating (Glidden) Mil-C-8514 (a) Glidden Paint Co. Polyvinyl butyral resin, zinc chromate, magnesium silicate, lampblack, (6) butyl alcohol, ethyl alcohol, acid component, phosphoric acid, water, ethyl alcohol.

The resin: polyvinyl alcohol, 10-20%, polyvinyl acetate 1-1.5%, volatile 80-92%. (6)

Rubber Adhesive, Mil-A-5092A - reclaimed rubber, neoprene or Buna-N is an aromatic solvent (Toluene). (6)

Rubber, Goodyear, Chemigum, Mil-S-7502B, Class B-2 (Aer), Goodyear Rubber Company. A synthetic rubber of the polysulfide type and a curing compound not dependent upon solvent evaporation. (6)

Spraylat (Spraylat Corp.) - plasticized resins and less than 1% ammonia sprayed as a translucent protective coat on plexiglass canopy. (6)

Strippers C-67D, Mil-R-7751A - for stripping steel or anodized aluminum; sodium monosilicate pentahydrate 48%; sodium trisilicate 48%; sodium resinate 4%; pH-11.5-12.5; 22.5-25% by wt. sodium peroxide. (6)

Stripper C-86 - Cresylic acid.

Transpo. Turco Products Co. - a two phase cleaner containing (6) methylene chloride and cresol in the lower layer and water in the upper.

Turco, 3002A. Turco Products Co. - a phosphoric acid brightener.

Turco, 3087C - a phosphoric acid brightener for aluminum. (6)

Turco, 4228 - a strong caustic for grease and carbon removal.

Vinyl paint for silk screen process MIL-D-8634A and Mil-P-8793, ASG - Vinyl resins and plasticizer 20%; isophorone ½%, petroleum naphtha 20%.

Westcoat clear #202, Jan-C-149-Type II, Western Coating Company (Improperly referred to as Eronel). It is a cellulose acetate butyrate compound corrosion preventive. Also contains plasticizers and stabilizers.

Sealant, Mil-S-7502 - a synthetic rubber of the polysulfide type sealing compound and a separate curing agent. (6)

* Numbers in parenthesis listed throughout this Report refer to the following stations:

(1) NSY San Francisco, California
(2) NSY Mare Island, California
(3) NSY Long Beach, California
(4) NSY Puget Sound, Bremerton, Washington
(5) NAS Alameda, California
(6) NAS San Diego, California
(8) NSY Boston, Massachusetts
(9) NSY Portsmouth, New Hampshire
(10) NSY New York, New York
(11) NSY Philadelphia, Pennsylvania
(12) NSY Norfolk, Virginia
(13) NSY Charleston, South Carolina
(14) NAS Norfolk, Virginia
(15) NAS Pensacola, Florida
(16) NAS Jacksonville, Florida
(17) NAS Corpus Christi, Texas
(18) NWP Washington, D. C.
(19) NSY #128, Pearl Harbor, Hawaii
(20) NAS Quonset Point, Rhode Island
(21) NAD Crane, Indiana

enclosure (1)

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